Before the Federal Communications Commission Washington, D.C. 20554

In the Matter of)	
Revitalization of the AM Radio Service)	MB Docket No. 13-249
)	

Comments of the National Alliance of AM Broadcasters

I. INTRODUCTION

On October 31, 2013 the Federal Communications ('FCC") released a Notice of Proposed Rule Making proposing changes to FCC rules and policies to revitalize the AM Radio Service ("AM NPRM"). The National Alliance of AM Broadcasters ("NAAMB") is a newly formed organization of broadcasters who are licensees of AM radio stations and providers of services to AM radio stations who are seeking the same goal as the FCC's AM NPRM, the revitalization of AM broadcasting in North America. A list of Alliance joint commenters is attached as Exhibit A.

The NAAMB supports each of the initiatives in the AM NPRM, but asserts that several of the implementation details proposed in the AM NPRM will be counterproductive, and that the totality of the measures put forth in the AM NPRM are grossly inadequate to the task of revitalization of Medium Wave broadcasting. Medium Wave broadcasting needs strong medicine to survive, and that half measures will only serve to extend a languishing demise of the medium. There are many reforms which are largely non-controversial and which should be put into place immediately. Many additional reforms require additional research and comment. The FCC should establish both a Continuing Notice of Proposed Rulemaking for those items where is not yet an adequate record of the viewpoints of interested parties, and additionally a Notice of Inquiry for those items proposed herein and by other commenters for which adequate data is not yet available. For proposals which NAAMB feels the urgency and record is adequate for immediate action, NAAMB has proposed language for potential rule revisions.

The NAAMB revitalization comments are based upon many principles:

- RF Noise levels from Power Lines, Part 15 and Part 18 devices are the greatest problem for AM Broadcasters
 - The FCC must implement an improved regime to protect licensed services below 30 MHz from RF noise.
 - AM broadcasters can partially compensate for excessive noise levels with more power
 - Digital modulation can partially compensate for the excessive noise level.
 - National RF noise reporting system
 - Enforcement
 - New regulation standards

- Medium Wave broadcasting must have an orderly transition to all digital broadcasting
 - IBOC HD Hybrid broadcasting is a detriment to the service and should be discontinued.
 - The channel 5 and 6 proposal has great technical merit, but may take too long to implement.
 - Digital Only Medium Wave stations on the air are the long term solution
- FM Translators can provide a lifeline for some, but not all AM stations
 - The AM NPRM proposed window for AM or Medium Wave Digital Stations is very helpful
 - The one-to-a-customer approach is counterproductive
 - Synchronous networks of FM Translators are required provide adequate service for AM.
 - Once authorized to AM, through an exclusive window or Mattoon Waiver the translator should be only permitted repeat a medium wave digital station (any) as primary
 - Rational protection of full service stations.
- AM Community Coverage Standards must be eliminated or modified.
 - AM stations provide service to markets, rural areas and groups of communities.
 - Many municipalities are exceedingly large and cannot be covered by any AM Station
 - AM siting restrictions define what areas can be served by AM stations.
- AM regulation is archaic and in many cases counterproductive.
 - The "ratchet rule" was defective from its inception and has been damaging to the service.
 - o "25% exclusion" in night allocations has been ineffective
 - Third adjacent channel protection is not effective and should be deleted.
 - Second adjacent channel protection at night should be changed to 5 mV/m or NIF
 - AM antenna efficiency rules inhibit locating transmitters in their ideal locations
 - Protected contours in present FCC Rules are unrealistic in the present RF noise environment.
 - Figures R-3 and M-3 are so inaccurate that changes are needed.
 - Transitional Hours rules (Critical Hours, PSSA and PSRA) must be revised
 - The AM station Classes do not properly utilize the spectrum and should be reformed.
 - Class A secondary service area is no longer viable, and inhibits other local service
 - Cost of proving compliance to FCC is detrimenal to correction of antenna problems
 - Negotiated Interference instead of "Interference Reduction"
 - Bandwidth measurements ineffective at limiting interference.
- AM stations pay a disproportionate share of FCC Fees
- Poor AM receivers are part of the problem
 - o Narrow Bandwidth, Low Sensitivity, Poor User Interface
 - o AMAX was a good idea, but the window has closed
 - Forget AM stereo
 - Digital detection needed, upgradable
- Legacy and Expanded Band how to use
 - No new analog stations
 - ∘ 520, 530 kHz and 1710 1790 kHz open for Digital only
 - Set expanded band rules same as the legacy band
 - Window for new Digital Only and Companion Stations
 - Synchronous networks High and Low power

II. Comments

1. FCC Proposal A – FM Translator Window.

The FCC has proposed that an exclusive window opportunity be provided for the licensees of AM stations to apply for FM Translators to rebroadcast the AM signal. We believe that this is an excellent idea which for many stations will provide an opportunity to provide FM service in their community. Several commenters have suggested that this window should be delayed until the LPFM settlement window is over, and NAAMB agrees, partially to avoid conflicts with the LPFM applications, which may not be in their final form. More importantly, it should be delayed to implement specific FM translator rule reforms, both unique to AM primary stations, and for all FM Translators. These changes are detailed below:

- 1. AM stations must not be limited to a single translator. The service of a single FM translator, in most cases is capable of covering only an a small portion of the AM station's service area, and is usually inadequate to "duplicate on FM" an economically viable portion the service area of an AM station. The FM translator will serve to confuse the listeners, as they can only hear the translator over a small area and be unaware that the programming is available on AM over a much larger area.
 - When an AM station licensee files multiple applications for FM translators which conflict with applications for another AM station, applicants with multiple applications for a single station should be required to rank order their applications. Where applications proposing different primary AM stations conflict, there should be a "technical settlement window" where the applicants are given the opportunity to resolve technical conflicts. If settlement is unsuccessful, then the applications are compared with the rank order of the other conflicting application(s). Applications of lower rank order are dismissed. Applications which remain conflicting with the same rank order would go to auction.
- 2. Multiple FM translators for an AM primary station should preferably be organized into single frequency networks to make most efficient use of the channels available. These single frequency networks of translators would have no specific co-channel protection ratio between members of a network, and all members of a single frequency network should be assigned the same rank order. FM booster technology has been well established for full service stations, and single frequency networks will work even better since the translator service areas will not be contiguous. TFT, Harris, Nautel and others have designed equipment to effectively synchronize FM stations. Many AM stations will operate their translator systems in monophonic mode for greater effective coverage. Monophonic FM single frequency networks have smaller self-interference areas than those which use stereo, and are much easier to time. Adding additional co-channel FM translators to be used in a single frequency network with an authorized FM translator serving as fill in service to an AM station should be permitted at any time, not just in application windows and be considered as FM Boosters for purposes of §74.1233 of the FCC Rules.
- 3. Parties other than AM licensees should be permitted to apply for FM translators within the AM translator window. There are many AM stations that do not have the capital to risk to implement FM translators on their own. A third party may be willing to risk the capital to implement an FM translator that could serve one of several AM stations, but not be willing

to invest in an AM station itself. These third parties should be permitted to apply for translators within the window(s), with the stipulation that the FM translator may only serve as a fill in translator for AM stations. Third party licensees may wish to rent the use of their translators or sell them outright to AM station licensees. Such applications would be considered, for processing purposes to be rank ordered at the same level as the lowest ranked application with which it conflicts, and never above second rank, thereby always considered of lower priority than an AM licensee applicant proposing its first translator.

- 4. AM station licensees who already own an FM translator serving their AM station wishing to acquire additional translators for its station in an AM exclusive window could be assessed a rank order penalty of ½ grade, giving them an advantage ahead of a competing application for a second translator.
- 5. FCC part 74 must be modified to provide some level of protection against abuse by full service stations who spuriously claim interference from translators. The risk of spurious complaints of interference and the uncertainty of the technical acceptability of an application makes the present rule formulation untenable for an applicant. The consolidation of broadcasting has made it a nearly assured situation that FM broadcasters in neighboring markets are competitors in the AM station market. A spuriously filed petition can hold up the implementation of FM translator service for an exceedingly long time, and delay the needed relief that the AM service requires. The present rule provides no assurance that any technical proposal can prevail.

Specifically: §74.1204(f) must be changed to wording similar to the following:

"An application for an FM translator station will not be accepted for filing even though the proposed operation would not involve overlap of field strength contours with any other station, as set forth in paragraph (a) of this section if the 1 mV/m field strength contour of the FM translator station will overlap a populated area already receiving a regularly used, off air signal of any authorized co-channel or first adjacent channel broadcast station, including Class D (Secondary) noncommercial educational FM stations, and the area is within the 50 dbu F(50,50) contour of the broadcast station, and the area of overlap contains the greater of 300 persons or 0.1% of the total population of the broadcast station within its protected service contour."

§74.1203(a)(3) must be changed to wording similar to the following:

"The direct reception by the public of the off the air signals of any authorized broadcast station including Class D (secondary) noncommercial educational FM stations, and previously authorized and operating FM translators and FM booster stations. Interference will be considered to occur whenever reception of a regularly used signal is impaired by a FM translator or booster station when that signal is within the 50 dbu F(50,50) contour, or where the desired signal is predicted to exceed 50 dbu 50% of the time, 50% of locations, 50% confidence using the Irregular Terrain Method at a the listener location. Interference will be considered to occur when more than 10 listeners are effected and identified.

6. Several commenters have proposed that FM translators with AM primary stations should be

permanently attached to its associated AM station. NAAMB believes that this concept is too restrictive. While it is reasonable to require that an FM translator acquired in an AM only window should be permitted to repeat AM stations only, it is unreasonable to require it to be attached to a specific AM station. There are many cases where an FM translator would be valuable and sold to another AM station in the market or an adjacent market. Owners of multiple AM stations within a market should be permitted to change their FM translators to other AM primary stations within their group.

7. §74.1201(j) specifies that the AM fill in area is the lesser of the AM station 2 mV/m daytime contour of the AM Station or a 25 mile radius centered a the AM transmitter site. FM stations have fill in service areas of 65.1 km (Class B) or 91.8 km (Class C). Simple fairness says that In Zones I and I-A the radius of the circle should be 65.1 km and in Zone II the radius of the circle should be 91.8 km. Assuming that the proposals in these comments are adopted, the limitations should not be the 2 mV/m contour, but the 1.0 mV/m contour. There is general agreement that the present 0.5 mV/m or 0.1 mV/m AM service contours are unrealistic. An AM service contour of 1 mV/m reasonably compares with a class B FM station's 54 dbu service contour, and should set a parity with FM stations in the same market. The contour level is particularly important because for AM stations with restricted daytime directional antennas, some AM stations could not locate its FM translator on its own tower due to the proximity of the 2 mV/m to the antenna site in the directional antenna nulls. There is no justification for setting a discriminatory eligibility for AM fill in FM translators, compared to HD-2 fill in translators, which have a substantially smaller service range than their host analog signal, but have translator eligibility to the edge of the host station's contour.

2. FCC Proposal B - Modify Daytime Community Coverage Standards for Existing AM Stations

NAAMB is in complete agreement with the comments of du Triel, Lundin & Rackley (dLR) on this matter, principal community service is an anachronism in the present media environment. There are many AM stations, under the present regulation which, upon losing their present transmitter sites would simply be required to surrender their license because due to land cost, local land use restrictions, and increased size of their city of license. There are many cases where it would be impossible for a station that lost its transmitter site to meet their present principal community coverage requirements from any available location. If the FCC finds that deletion of §73.24(i) in its entirety, is too controversial, then NAAMB strongly encourages that as a minimum, the requirement of providing night "principal community service" be deleted, and to change the daytime required contour to 2 mV/m instead of 5 mV/m.

3. FCC Proposal C - Modify Nighttime Community Coverage Standards for Existing AM Stations - See FCC Proposal B

Night community coverage is even more difficult to meet, as many stations can only operate with lower power at night than in the daytime due to the need to protect distant stations from skywave interference and the high level of interference from other stations. In the case that it is too controversial to delete Daytime principal community coverage, then as a minimum, eliminate night principal community coverage requirements.

4. FCC Proposal D – Eliminate the AM "Ratchet Rule"

NAAMB is in complete agreement with the comments of du Triel, Lundin & Rackley (dLR) on this matter. The request for the rule change made by the petitioners in RM-11560 should be immediately granted. The record of the commentors in this proceeding is unanimous in favor of making this rule change. There is no need to involve this noncontroversial, and important rule change in a larger proceeding that will only delay its implementation.

5. FCC Proposal E – Permit Wider Implementation of Modulation Dependent Carrier Level Control Technologies

NAAMB is in complete agreement with the comments of du Triel, Lundin & Rackley (dLR) on this matter. Several additional commenters have proposed limiting positive modulation in the interests of limiting occupied bandwidth. Such a limit may preclude some of the most effective methods of MDCL control.

Positive modulation percentage has little or no impact on out of band energy for modern transmitters excepting those cases where the modulation capability of the transmitter is exceeded. §73.1570(b)(1) needs to be modified to accommodate the parameters of MDCL control technology. It would be more appropriate to simply specify that the Peak Envelope Power of the transmitted signal shall not exceed 5.07 times the maximum authorized carrier power and not exceed the transmitter rated PEP for each mode of operation. This should be specified in all new transmitter type verifications.

6. FCC Proposal F - Modify AM Antenna Efficiency Standards

NAAMB is in substantial agreement with the comments of du Triel, Lundin & Rackley (dLR) on this matter. Eliminating these requirements will permit the use of antennas and sites to correspond with the local land use and other considerations, while still providing effective coverage. The FCC should concern itself with avoidance of interference to other stations. DLR's proposal that reliance on the present minimum efficiency standards for allocations purposes, and assume that the effective radiated power will be lower should be acceptable for daytime allocations. The use lower efficiency in establishing operating power should be permitted, but not required, at licensing. The presentation of measurements and/or modeling establishing the actual lower efficiency are made at time of licensing. These measurements should permit actual power dissipated in resistive loading or field intensity measurements to be used in establishing transmitter power at licensing.

In general, NAAMB recommends a permissive approach to unconventional antenna designs. Valcom, Kinstar, Cross Field Antennas should be permitted for both directional and omnidirectional antennas, providing that adequate documentation is provided at licensing time to show that no interference will be caused to other stations. Technical difficulties of narrow bandwidth, equipment breakdowns, low efficiency etc, are issues that should be between the vendor and the broadcaster, not the FCC.

7. FCC Proposal Request G – Submission of Further Proposals.

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NAAMB believes that the proposals in the NPRM will be helpful in slowing the decline of the AM Broadcasting service, but are wholly inadequate to succeed in "Revitalizing" the service. Other commenters have made valuable suggestions and instead of separately developing these proposals we will first put forth our agreement and differences with some of the most

comprehensive proposals filed.

First are the comments of du Triel, Lundin and Rackley ("dLR") a highly respected engineering consulting firm:

1. dLR Further Proposal 1 - Allow No Applications for New Analog AM Stations

The AM broadcasting service is mature. NAAMB agrees in principle with the comments of du Triel, Lundin & Rackley (dLR) on this matter. NAAMB believes that there is no need for new Amplitude Modulated stations in the medium wave band, and the FCC should foster no new service using amplitude modulation. NAAMB believes that applications for digital only companion stations and applications for new medium wave digital only stations should be considered going forward. NAAMB proposes that shortly after long form applications have been filed for AM auction window #84, the AM rule changes recommended herein implemented and the AM CDBS database is updated a window be scheduled for applications for Digital Only Medium Wave (DMW) companion stations and new DMW stations on all legacy channels, expanded band channels, and 530 kHz.

2. dLR Further Proposal 2 – Adopt Daytime Protected Contour Levels That Are More Resistant to Noise.

NAAMB agrees with dLR that the daytime protected contours for AM stations are completely unrealistic. For Classes B, C and D dLR proposes that the protected contour be raised from the present 0.5 mV/m to 2.0 mV/m. Although technically correct, this will decrease the "coverage map" and claimed population coverage of stations very substantially, potentially decreasing the marketability of AM stations. NAAMB believes that raising the default protected contour to 1.0 mV/m and all locations with a population density exceeding 1000 persons per square kilometer, and locations with no population may optionally protected to only the 2.0 mV/m contour for allocations purposes. Locations with no population should be considered for areas such as brownfields, bodies of fresh water and escarpments which may be islands of no population included within urban areas. This scheme will establish a default service contour which remains suitable for rural service and highway driving, while providing a realistic, optionally evaluated, contour for urban areas that have higher noise levels.

Class A stations are presently protected to the 0.1 mV/m contour co-channel and the 0.5 mV/m contour first adjacent. Since class A stations are chartered to serve large areas, often including rural areas NAAMB proposes that the Class A protected contours be changed to 0.5 mV/m co-channel, and 1 mV/m contour adjacent channel both day and night. Since it makes no sense to protect areas which actually have no service, it is proposed that the protected contour at locations with population density exceeding 1000 persons per square kilometer, or no population may optionally be protected to the 2.0 mV/m contour for allocations purposes.

3. dLR Further Proposal 3 – Change the Requirements for Protection of Class A Stations to the 0.5 mV/m Groundwave Contour Level Day and Night

NAAMB agrees with the proposal of dLR to increase the co-chanel night protected contour of class A stations to the 0.5 mV/m groundwave contour. NAAMB proposes to further protect class A stations on adjacent channels to the 1.0 mV/m contour. Additionally, areas which cannot be served by these levels of signal, ie those with population densities over 1000 persons per square kilometer, should be optionally evaluated with a protected contour

- of 2.0 mV/m for allocations purposes. It is unlikely that this optional protection would be useful, but is included for consistency purposes.
- **4. dLR Further Proposal 4 Return to 0 db First-Adjacent Daytime Protection Ratio** NAAMB conditionally supports the dLR comments with respect to return to 0 db first-adjacent protection ratio. For this to be practical HD Hybrid AM IBOC operation must be discontinued. Properly adjusted Analog transmissions with appropriate audio low pass filtering, HD Radio Digital Only on medium wave and DRM digital radio are all compatible with the 0 db daytime protection ratio.
- **5. dLR Further Proposal 5 Eliminate Third-Adjacent Groundwave Protection** NAAMB supports the dLR comments in relation to eliminating third-adjacent channel protection provided hybrid HD Radio AM IBOC operation is discontinued.
- **6.** dLR Further Proposal 6 Change Back to Nighttime RSS 50% Exclusion NAAMB supports the dLR comments in using the former 50% exclusion method.
- 7. dLR Further Proposal 7 Standardize on Site to Site Nighttime RSS Limit Calculations

NAAMB supports the dLR comments in using site to site night protection of Class B stations.

8. dLR Further Proposal 8 – Eliminate Nighttime Skywave First-adjacent Channel protection.

NAAMB supports the dLR comments proposing to eliminate Nighttime Skywave First-adjacent channel protection for Class B stations.

9. dLR Further Proposal 9 – Return to Former Method for Calculating Skywave Signal Long-Path Propagation to Domestic Stations.

NAAMB agrees the the dLR comments that the presently used skywave model is unrealistic, and supports the dLR proposal to utilize the formerly used more accurate methodology.

10. dLR Further Proposal 10 – Eliminate Consideration of Received Daytime Overlap from Foreign Stations

NAAMB supports the dLR proposal to ignore received daytime overlap from foreign stations in domestic allocations.

- 11. dLR Further Proposal 11 Change the Rules to Permit Station Improvements Based upon Changes at Other Stations Without Regard to Interference Reduction NAAMB supports the dLR proposal to permit agreements for mutual changes to station facilities without regard to overal interference reduction. Generally, interference reduction is a false notion when the major interference to AM stations is the result of Part 15 and Part 18 radiators.
- 12. dLR Further Proposal 12 Change the Bandwidth Mask for AM Signal Transmission and Eliminate the "NRSC" Response Curve

NAAMB is concerned with two aspects of the dLR proposal to change the "NRSC" curve. The first is the choice of 6 kHz, as a rolloff frequency, as the introduction of a "sharp cutoff" filter in the system a frequency where there remains substantial where there remain improvements in articulation of human voice through 7 kHz, and entire musical instrument spectrums exist above 5 kHz. NAAMB suggests that research is needed to determine the ideal cutoff frequency for a replacement curve. The second aspect is the additional cost of equipment changes across all AM stations, many of which are in a very financially constrained condition. NAAMB proposes that the FCC make no changes to the mask except elimination of the NRSC pre-emphasis at this time. This can be accomplished by changing a switch position on most equipments.

13. dLR Further Proposal 13 – Eliminate the Requirement for Periodic "NRSC" Emission Measurements.

NAAMB wholeheartedly supports the elimination of these redundant and wrong headed measurements for analog stations. The close in spurious "splatter" on modern AM stations is almost entirely the result of negative peak overmodulation, which is controlled by the audio output of the final limiter, and subject to change by the slightest adjustment. A periodic measurement is not meaningful, as this adjustment might be changed at any time.

14. dLR Further Proposal 14 – Enact Allocation Rules for Use in the Expanded Band.

NAAMB agrees that the Expanded band should be resource to solve the problems of Medium Wave broadcasters. NAAMB proposes that allocation standards be established for the expanded band equivalent to those for the legacy band, and to also include 530 kHz as a resource for digital only stand alone and digital companion stations. The FCC should also consider the allocating 520 kHz, 530 kHz and 1710 -1790 kHz to medium wave broadcasting to provide opportunities for new digital medium wave stations, and changes of channel for existing AM stations.

15. dLR Further Proposal 15 – Modify the Requirements for Partial Proof of Performance Radials

NAAMB agrees that partial proofs should only include the monitor point radials.

16. dLR Further Proposal 16 – Revise the Ground Conductivity Map to Better Reflect Actual Conditions

NAAMB supports dLR's proposal to adjust the ground conductivity values to a better approximation of the actual field values.

17. dLR Further Proposal 17 and 18 – Change the MoM Directional Antenna Proof Rules to Eliminate the Recertification Measurement Requirement and bench testing

NAAMB supports the dLR proposal to eliminate costly recertification measurements every two years. Bench testing of current and voltage samplers is counterproductive, as they are passive devices which are more likely to be damaged or exchanged in bench testing than to "drift' out of tolerance.

18. dLR Further Proposal 19 – Change the MoM Directional Antenna Proof Rules with Regard to Indicated Software Errors

It is important that regulation be clear in differentiating between warnings and errors in software used in modeling broadcast antennas. NAAMB supports the dLR proposal.

19. dLR Further Proposal 20 – Change the MoM Directional Antenna Proof Rules with Regard to Survey Requirements

NAAMB does not support the dLR proposal to eliminate survey requirements for existing arrays being converted to MOM proofs. Members of the organization have found several stations where the directional antenna element relative locations did not conform to the license and the conventional proof was "jimmied" to work.

20. dLR Further Proposal 21 – Clarification of the MoM Directional Antenna Proof Rules with Regard to Shunt Capacitance Effects

NAAMB supports the dLR proposal to clarify this regulation.

21. dLR Further Proposal 22 – Change the MoM Directional Antenna Proof Rules with Regard to Reproofing when Antennas are Added to Towers

NAAMB agrees that the simplified procedure used by the staff, as outlined in the dLR proposal should be codified in the rules.

The Broadcast Maximization Committe has pending a rulemaking proposing the use of TV channels 5 and 6 for digital audio broadcasting, providing a migration path for AM stations to VHF service.

BMC Further Proposal - Broadcast Maximization Committee's proposal in MM Dockets No 07-294, et al.

NAAMB supports the proposals of the Broadcast Maximization Committee's proposal to migrate, on a voluntary basis, AM stations to a new Digital VHF service on channels 5 and 6. This proposal, using largely vacant spectrum to provide space for AM stations is an

excellent concept, also providing spectrum to provide for LPFM style noncommercial stations and opportunity for entrepreneurs to open new stations in certain areas is very attractive. It has opposition from LPTV, TV translator, and Class A TV operators, as well as the few remaining full-power TV stations. This service will certainly not be available until after the TV repacking is completed, and probably much later because of opposition from incumbent interests. Unfortunately, the needs of AM broadcast relief are immediate, and an eventual and obstructed path to relocation of AM broadcasters is on the distant horizon.

8. NAAMB Proposals

1. Further Proposal 1 – Domestically Revise AM Classes and protection

The present scheme of AM radio classes is as follows:

Class	Power	Protection	Service
A	10-50 kW	0.1 mV/m day 0.5 mV/m adj chan 0.5 mV/m 50% skywave	Large Area
В	0.25 -50 kW	0.5 mV/m day 25% NIF groundwave Night	Regional
С	0.1 – 1 kW	0.5 mV/m day No protection at night	Local 1230, 1240, 1340, 1400, 1450, 1490 kHz only
D	.25 – 50 kW d <141 mV/m	0.5 mV/m day No protection at night	Day
EX	10 kW Day 1 kW Night	Protected by distance table	1610 – 1700 kHz

NAAMB proposes that this table be revised as shown below:

Class	Power	Protection	Service
A	10-100 kW D 10-50 kW N	0.5 mV/m co-channel groundwave 1.0 mV/m adjacent channel groundwave	Large Area 73.25(a)-(c) channels
В	0.25 1 – 50 kW ¹	1 mV/m day ³ 50% NIF groundwave Night	Regional 530- 1700 kHz except 1230, 1240, 1340, 1400, 1450, 1490 kHz
D	0.1 -50 kW D ² 0 - 1 kW N	1 mV/m day ³ No Protection night	Primarily day service 540-1600 kHz

Notes: 1 Present Class B stations would remain Class D

- 2 Former Class D and C stations
- 3 2.0 mV/m in locations with >1000 persons / sq km, optionally, for allocations purposes

This revised organization of AM classes, and revised protections recognize of the fact that AM stations suffer severe interference from Part 15 and Part 18 devices as well as noise from the electrical power distribution grid, and other RF noise sources in the environment. It is not only that many Part 15 and Part 18 devices do not meet FCC

emission requirements, but that there are so many of them. At one time a home might have a noisy mixer, and a TV that radiated every 15.748 kHz through the band. These noise sources were only emitting when they actually were in use, and there were only two in the home. The same household now has hundreds of emitters, CFL lamps, LED lamps, switching "wall wart" power supplies, lamp dimmers, computers, set top boxes, game consoles, controllers in each appliance, and ethernet networks to carry the signals around. Particularly difficult is the fact that many of these devices are left on all the time.

Old protected contours no longer provide service, and today's protected contours must reflect this reality. This proposal also assumes that there will be no new AM stations (excepting medium wave digital stations). Two major elements of this reorganization is the re-classifying of Class C stations to Class D and reclassifying Expanded band stations to Class B.

AM Class C stations are presently limited to 1 kW, which in many cases cannot cover a large enough portion of their market to be viable. They are not protected from night interference, similar to the night operations of Class D stations. By combining them into a single class, the class C stations can improve their day service area by using a day power of up to 50 kW where protection of other stations can be accomplished. Expanded Band stations are presently a special group of Class B stations. NAAMB proposes to provide a uniform allocations scheme for Class B stations over the entire band, and aditionally make the frequency of 530 kHz available for new digital stations and digital companion stations. Expanded band stations will be able to increase power up to 50 kW, and improve night coverage with directional antennas. NAAMB also proposes the addition of 520 kHz and 1710-1790 kHz to the pool of frequencies available to institute medium wave digital broadcasting. In the case that these ten additional frequencies can be made available it is recommended that they be authorized only for Digital stations because there are few receivers able to tune these frequencies, and only new digital receivers are likely to be able to tune them.

2. Further Proposal 2 – Revise transitional hours regulation.

NAAMB proposes a reform of AM transitional hours regulation. Presently there are

three components: Critical Hours limitation for class A stations, Pre-Sunrise Service Authorization (PSRA), and Post Sunset Service Authorization (PSSA). The FCC has not been regularly issuing or revising PSRA and PSSA authorizations for several years because it was found that the software that had been previously used at the FCC was defective. Transitional hours are critical to an AM station's success because the highest radio listenership occurs between 6 AM and 9 AM and 4 PM and 6 PM, hours that typically are near sunrise and sunset. Improved operating power or generous antenna parameters during these hours is very beneficial to AM stations that have reduced or no regular night operation.

Critical Hours

NAAMB proposes that Critical hours limitations toward domestic Class A stations be revised to reflect the revised protected contour of the various classes. This would mean that both the distance to the protected contour, and the value of the protected contour would change due to the revision of the class A station service contour value. In this way, Class A stations would remain protected from the effect of "daytime" skywave interference.

During the solar minimum several years ago, many Class B and Class D stations suffered severe skywave interference during the hours after sunrise and before sunset. This was a relatively new phenomenon because the maximum power of Class B stations was increased from five to fifty kilowatts. This interference will recur again when the sun once again enters the quiet part of its sunspot cycle. Medium Wave skywave propagation is inhibited by the ionization of the D-layer of the ionosphere which absorbs medium wave radio signals so they cannot reflect from the ionospheric E-layer and back to earth. During the night time, the sun's rays are blocked by the earth and the D-layer loses ionization and cannot block the radio waves. The sun's ability to ionize the D-layer is proportional to the Solar Flux. When the solar flux is high, the D-layer ionizes very quickly and takes a while to dissipate. When the solar flux is low the D-layer is weak, and takes a while to form and dissipates very quickly. Because the D-layer for more than ½ hour after sunset and before sunrise occurs on the ground.

Any Class B or D stations that presently have a critical hours restriction, and have

identical critical hours and daytime antennas can simply be given show cause orders to increase critical hours power to regular day power, or to twenty five times their presently authorized critical hours power, whichever is less. Stations seeking to use their day antenna during critical hours would provide an engineering report showing that the antenna meets the revised critical hours limitations as part of an FCC form 302-AM to operate by direct method application.

Secondly, all AM stations of of 10 kW or greater should be required to provide critical hours protection to other Class B and D domestic stations when they change their facilities. This protection, could be much simpler than the present class A protection. A proposed method that stations protect each other during critical hours using the formula: F = (900 + 4.5 * P * D)/f

where F = maximum permissible radiated field in mV/m at 1 km toward the transmitter site of the effected domestic co-channel station,\

P = protected contour value in mV/m of the effected station,

D = the Distance from the transmitter site to the protected station in kilometers, and f = the frequency in MegaHertz.

It is also reasonable to use this formula for protection of class A stations, except that the distance and bearing would be toward points on the 0.5 mV/m contour of the class A station.

Thirdly, the definition of when critical hours protection must be applied should be adjusted by the monthly lagging average Solar 10.7 cm Flux, the solar source of D-layer ionization. NAAMB proposes that stations with critical hours limitations protecting domestic stations, be permitted to use their regular day facilities immediately after local sunrise and until local sunset if the solar flux units average, for the previous month, exceeds 125, and from one hour after local sunrise to one hour before local sunset if the average exceeds 100. For solar flux unit averages below these values, stations must use their critical hours facilities for two hours after sunrise and before sunset. The problems of daytime skywave interference received at several stations from high power class B stations were reported to Radiotechniques, one of the members of the Alliance. The interference was severe at a solar flux unit range of 75 or less, became much less problematic around 100, and was virtually nonexistant at 125. Solar Flux Unit averages

are available from the Canadian Penticton observatory on the web at http://www.spaceweather.ca/solarflux/sx-5-mavg-eng.php

PSSA and **PSRA** operation

FCC regulations and the US-Canadian and US-Mexican AM Broadcasting regulations provide for special operation during the two hours before sunrise and after sunset. The present regulations are overly complex and should be overhauled. The NAAMB proposes that these regulations should be revised as follows:

All class B and Class D stations may operate from 6 AM local time to local sunrise at its the licensed day or night power limited to 500 Watts, using its licensed day, night or auxiliary antenna provided:

- 1. Full night protection is afforded to foreign stations excepting Canada, Bahamas or Mexico
- 2. Full night protection is afforded to Canadian, Bahamian and Mexican Class A stations using diurnal factors as described in the appropriate agreements.
- 3. Full co-channel night protection is afforded to domestic class A stations groundwave contours using diurnal factors
- 4. Between the beginning of Daylight Savings Time and the end of April, and between the end of October and the end of Daylight Savings Time stations will be authorized a minimum of 10 Watts unless a lower power is required by international agreements.

All stations may operate from 2 hours before local sunrise until local sunrise and from local sunset until two hours after local sunset at up to licensed day or night power (whichever is higher) using its licensed day, critical hours, night or auxiliary antenna, at a power not to exceed the licensed day, or night power provided:

- 1. Full night protection is afforded to foreign stations excepting Canadan, Bahamian or Mexican stations
- 2. Full night protection is afforded to Canadian, Bahamian and Mexican stations using diurnal factors as described in the appropriate agreements.
- 3. Full night co-channel protection is afforded to domestic stations using diurnal factors

Authorizations would be secondary, and subject to modification, as is the case with present PSSA and PSRA authorizations.

Authorizations would be by minor change application to the FCC specifying the power, and authorized antenna is to be used for each 30 minute period of operation.

Rounded minimum power from 6AM local time to sunrise and from sunset until 6 pm will follow the rounding guide of §73.99(f)(6)(iv)

Existing PSRA and PSSA authorizations would continue until modified per §73.99(j) or by application.

Where it can be shown that foreign stations and allocations have been vacant, silent or

foreign class A stations operating at reduced power for at least one year, temporary authorizations may be issued for higher power or different antenna where that station(s) or allocation(s) is (are) not protected. An alternative specification for operation shall be made at the time of application showing the proposed conditions of operation if the foreign station(s) resumes operation. When the foreign station becomes operational, the transitional hours authorization will automatically revert to the alternate parameters which fully protect the foreign station.

This simplification and extension of the current PSRA and PSSA rules will permit expanded operation during the very important "drive time" programming hours providing a more uniform (to the listener) experience year round.

Further Proposal 3 - Digital Only Medium Wave Stations

Although IBOC FM HD radio has had some measure of success, AM hybrid IBOC has been a complete disaster. Of the 300 stations who have tried AM IBOC broadcasting only a tiny fraction continue. This is because even with ideal equipment integration and tuning AM IBOC serves only a small fraction of the analog AM service area, and stations with troublesome directional antennas cannot be equalized for satisfactory performance. Additionally, the adjacent channel noise and interference to stations on neighboring channels is overwhelming, and a primary reason for our hesitancy in endorsing the dLR comments proposing a zero db protection ratio for first adjacent-channel allocations.

It has been shown that hybrid AM HD operation causes significant in-market and skywave adjacent channel interference to other stations. Alternatives such as overall transition to HD Radio MA-3, MA-4 and/or Digital Radio Mondiale DRM-30 systems are needed if AM radio will have a successful transition to digital broadcasting.

For these reasons NAAMB proposes that AM IBOC hybrid transmissions be discontinued.

Experiments with medium wave HD Radio full digital operation under MA-3 and MA-4 modes has demonstrated it to be an excellent media, with only modest first adjacent channel interference potential, good immunity from co-channel interference and excellent performance in a noisy environment with Part 15 and Part 18 devices. The Digital Radio Mondiale DRM-30 system has carriers only within 5 kHz (or less) of the channel center frequency, and provides nearly ideal first adjacent channel isolation, along with the other benefits of HD Radio MA-3 and MA-4 modes.

NAAMB proposes that the FCC immediately permit AM stations to begin digital operations using HD Radio MA-3 and MA-4 modes, as well as operation with DRM-30 and other ODFM modulation systems that maintain all carriers within 10 kHz of the center frequency.

NAAMB proposes the use of digital companion stations paired with their primary analog AM stations. The pair should count as a single station for multiple ownership, station transfer, regulatory fee and copyright purposes. Digital companion stations must have identical programming to their analog partner, and have conforming call signs with the call sign extension "-DR". The licensee of a pair of companion stations should be permitted to exchange which station transmits digital signals, and which transmits analog AM. Additionally, the

analog companion should be permitted to become an independent station by switching to digital modulation and changing its call sign, essentially making a second digital medium wave station. A digital companion or stand-alone station should not be permitted to switch to AM except by exchange which station is digital with its companion. Companion stations should overlap their service areas with their analog partner station by at least 50% of the smaller coverage. The AM companion station should transmit a subaudible code to identify the frequency and transmission system of its digital companion station to effect automatic switching to the digital signal.

For this reason, **NAAMB proposes that the FCC open a window** for AM stations to apply for **digital companion stations** in their own markets, and for entrepreneurs **to apply for new digital only medium wave stations**.

Entrepreneur applicants for new digital medium wave stations will have a lower priority at the application stage than an application for a digital companion station with which it conflicts. New Digital Medium Wave station applicants should be given an opportunity to resolve technical conflicts with companion station applicants, including choice of an alternate frequency. If no nonconflicting solution is found, the new application would be dismissed in favor of the companion station application. Competing applications for digital companion stations or for new Digital Medium Wave stations will go to auction.

Licensees with multiple AM stations within a market should also be permitted designate an (or several) of their AM stations to become companion digital medium wave stations paired to another of their stations.

Further Proposal 4 – Adjust FCC regulatory fee structure

The FCC regulatory fee structure is patently unfair to AM broadcast stations. When considered on any basis, the regulatory fees are much higher than reasonable.

- When evaluated on a bandwidth basis, an AM station is allocated a 10 kHz channel. FM stations in comparison are allocated a 200 kHz channel. From a bandwidth point of view, AM stations should be assessed a regulatory fee no more than 5% of a comparable coverage FM Station.
- When evaluated on a channel basis, AM stations are capable of a single program channel. HD Radio stations are capable of transmitting up to four program channels, all of which have program quality exceeding that of an AM station. On this basis, AM stations should be assessed a regulatory fee of no more than 25% of a comparable coverage FM station.
- When evaluated on the basis of the value of the type of spectrum, the AM band is much less desirable: It has a much higher noise level, it requires much larger antennas and the signal propagation is very variable. Medium wave frequencies are worth less than 25% of VHF frequencies covering the same population.
- A daytime AM station may present its programs only 50% of the time that a Full time AM station can. On this basis, Daytime AM stations should be assessed a regulatory fee of no more than 50% of a comparable coverage Class A AM station.
- Class B AM station will have a reduced service area at night compared to its day coverage. On this basis, AM stations with reduced night coverage should be assessed a regulatory fee of no more than 50% of a comparable day coverage Class A station, plus 50% of the regulatory fee of

a class A station with comparible night groundwave coverage.

In summary, NAAMB proposes that Class A AM stations should be assessed between 2% and 10% of the regulatory fee of an FM station with comparable population within its coverage area. Class D stations should be assessed no more than 50% of the regulatory fee of a Class A AM station with comparable population within its coverage area.

Class B stations should be assessed a fee based upon population within its day coverage area and its night coverage area.

Further Proposal 5 – Exempt AM stations and Digital Medium Wave stations from the Local Radio Ownership Rule

AM radio stations can transmit only a single program channel, whereas FM stations can program as many as four. Daytime AM stations may program only 50% of the time. AM stations do not hold strong audience positions within their markets. Under §73.3555, each fulltime AM station should only count as ½ of a radio station (with FM providing four voices, and AM stations only one, and each daytime station should count as 1/8 of a radio station. This would mean that, for example in a market with 14 or fewer full power stations, a single licensee should be permitted to own up to 12 AM stations, more than are likely to exist within the market.

Therefore, NAAMB proposes that the FCC exempt AM stations from the local radio ownership rule.

Further Proposal 6 – Exempt AM and Medium Wave Digital stations from the "rural radio proceeding" rules

Assuming that there will be no new AM stations, the rural radio proceeding rules would pertain only to changes in existing stations. Most AM station changes are to accommodate loss of transmitter site, moving to multiplex AM stations on single towers or arrays, or to compensate for changes in population distribution within a market. AM stations are generally not major forces within a market, and it is essential that their licensees have the flexibility to deal with the problems of changes within a market without incurring the expense and delays that are involved in compliance with the rural radio proceeding rules.

There are now no Digital Medium Wave stations. Location of the first Digital Medium Wave stations must be within urban areas in order to assure success of the new class of station. The FCC has determined that mature radio services must not be concentrated in the urban centers, however Digital Medium Wave Stations are an entirely new class of station that, in order to succeed must be able to be heard by the maximum number of people to assure adoption by the public.

In order to build acceptance of Digital Medium Wave broadcasting, it is essential that a variety of program choices using this new media are available in the urban centers. Without urban coverage the technology cannot gain traction. It is essential that Digital Medium Wave stations be located in contravention to the principles of the rural radio proceeding for it to succeed. Locating them only in more rural areas would be counterproductive to this essential goal.

Therefore NAAMB proposes that AM and Medium Wave Digital Station applications be exempted from the requirements of the "rural radio proceeding".

Further Proposal 7 – Amend Part 15 and Part 18 of the FCC rules to better protect Medium Wave frequencies, and provide a mechanism to identify noncompliant devices and installations.

FCC part 15 Subpart B - \$15.103 exempts many devices which specifically cause interference to AM radio stations. §15.103(a) exempts devices used in vehicles, which is where the majority of radio listening is accomplished. There are many times when the noise from an 18 Wheeler will blank out an AM station for 100 yards or more. This is problematic if a listener is traveling in the same direction as the truck. §15.103(h) exempts devices which operate within the AM band. The frequency of the exemption should be changed to 515 kHz from 1.705 MHz.

Automotive control systems often "block out" AM signals by radiating or conducting clock signals every 60 or 100 kHz throughout the AM band or cause wideband noise that limits the sensitivity of automotive AM receivers. §15.103(a) should be modified to remove the exemption for automotive components. The FCC should require automotive manufacturers to limit spurious radiation and conduction within vehicles or, in the alternative to communicate the frequency to which the the AM radio in the vehicle is tuned on the automotive data buss, so that the clock frequency of the devices may be shifted to adjust the frequency of the spurious signals to avoid the AM frequency in use.

NAAMB proposes that the FCC employ a web based reporting system for users to report devices which appear to violate Part 15 and Part 18 devices and installations which generate excessive **noise.** The consumer and radio station reports will allow the FCC to concentrate its limited enforcement efforts to devices and systems that cause the greatest problems. The reporting system should have both basic and expert sections. Consumers could report noisy devices, for example and enter the FCC ID of the device. When the FCC receives multiple reports of noisy devices, investigate the report and if they are found in violation, it can contact the importer or manufacturer and halt the marketing of the device and/or arrange a recall of the device.

Station personnel could use the expert version of the system to report noisy high voltage power lines or LED traffic signals that cause interference, the station(s) receiving interference, and the area effected. The station personnel would be asked for more information, such as the geographic coordinates, and if known the operator of the power line or traffic signal so that the FCC can report the problem to the appropriate authority. This system will permit the FCC to notify operators of problems, and know if the problem was resolved. The station personnel can update the system if the problem is not resolved within a reasonable period, so that the FCC can effect enforcement actions. This portion of the system will do an "end run" around utilities that make it hard for broadcasters to even reach those responsible for resolving RF interference issues within the utility.

Such a web based clearinghouse would greatly simplify and focus FCC enforcement actions so that the most serious problems are given the appropriate weight. A device that is distributed in small numbers that is seriously out of specification is unlikely to cause as much trouble as a device our of specification by only 10 db, but produced by the millions. The FCC can concentrate on devices with thousands of complaints and avoid putting effort into devices with tens of complaints, unless it causes danger to life or property.

Further Proposal 8 – The FCC should establish the requirements for digital radios, both HD Radio and others to be software field upgradable and multi-standard.

NAAMB recognizes that after RF noise generated by Part 15 and Part 18 devices and high voltage power lines, the next most significant cause of weakness in the AM radio service is due to terrible AM receivers. The use of very narrow ceramic filters, noisy local oscillators, low dynamic range mixers

and non-linear demodulators have degraded the performance of AM receivers to a point where many receivers cannot produce a good sounding signal from even the best engineered station. Other problems include nearly impossible to find AM-FM switches, inaccurate frequency display and awkward tuning methods.

NAAMB also recognizes that while FCC may have limited ability to effect the quality of AM receivers, but it is within its authority under part 15 to specify the ability accommodate the systems that are approved by the Commission for transmission, as it has done with TV receivers and converters.

The hardware needed to receive any form of Digital Medium Wave broadcasting (non-IBOC) is virtually identical. The reception of HD Radio MA-3 and MA-4 modes, DRM-30 and any other system using QAM-64 (or more robust signals) and ODFM in a 20 kHz or less bandwidth can be accomplished with completely identical hardware. This hardware is also capable of receiving conventional AM broadcasting in very high quality.

Since the hardware is identical, there is no reason why Digital Medium Wave receivers cannot be multi-system, and have provisions for future improvements in the technology of codecs, error correction, frequency coding, etc that will be developed in the future. Since the inception of HD Radio and Digital Radio Mondiale, there have been many improvements in the digital radio decoding methods. Many of these improvements are not software backwards compatible, for example, improvements in audio codecs often require upgrading the software of the decoder to gain full benefit.

NAAMB requests that the FCC require in Part 15 of its rules that all radios capable of receiving digital transmission between 520 and 1790 khz (or the limits of the band as set by the FCC) shall:

- Tune the entire band
- Have a provision for field upgrade or over the air software upgrade to any FCC approved system
- Have adequate memory to accommodate more than one system at a time
- Automatically identify and switch to the system in use at a given station
- Automatically switch to AM detection if there is no digital station in range
- Automatically switch from the AM companion station to the Digital Companion station if there is a adequate signal (Recognizing that the digital companion stations may not have identical coverage to the AM companion station.)

Further Proposal 9 – The FCC should regularly license AM and Digital Medium Wave single frequency networks

Single frequency networks for AM stations have had a mixed history, from early experiments at WBZ and WBZA with mixed results, long lasting and successful operations like WLLH in Lowell and Leominster, MA.

Most of the technology for successful AM synchronous operation is at hand, with precision carrier frequency generation, precision audio delays and sophisticated tools for designing single frequency networks.

What is missing is the ability to use low efficiency low profile antennas at low power, such as the Valcom antenna at low frequencies and Rooftop "T" antennas for the synchronous members of the

network. Hopefully this missing piece will be in place with the adoption of FCC proposal F.

The time is right for the FCC to authorize AM and Digital Medium Wave single frequency networks. NAAMB proposes several guidelines for the authorization of Single frequency networks.

- Carrier frequency shall be locked to a specific reference, not simply fixed relative to the members of the network. A single external reference (ex, GPS) provides the opportunity for interference reduction to stations not within the network by eliminating beat interference.
- For the purpose of determining skywave interference caused by synchronized networks; if any two transmitters are less than 400 km apart, the network shall be treated as a single entity, the value of the composite signal being determined by the quadratic addition of the interfering signals from all the transmitters in the network. If the distances between all the transmitters are equal to 400 km, the network shall be treated as a set of individual transmitters.
- For the purpose of determining skywave interference received by any one member of a network, the value of the interference caused by the other members of the network shall be determined by the quadratic addition of the interfering signals from all of those elements. If groundwave interference is a factor at the element site, that shall be taken into account.
- The protection ratio between Analog AM stations belonging to a synchronized network is 8 db.
- The protection ratio between Digital Medium Wave stations belonging to a synchronized network is dependent on the system in use, and the geographic geometry of the system.
- Members of a synchronized network may operate at any power not exceeding 105% of the authorized power.
- The amount of mutual interference between members of a synchronized network is established by the licensee.
- The members of a synchronized network within the same market are considered as a single station.
- Members of a synchronized network in separate markets are separate stations, and may be designed to be synchronized only during day, or night hours.
- Members of a synchronized network may operate only during day, or night hours.

Conclusion

AM radio needs strong medicine. The measures to revitalize broadcasting's senior medium must be wide ranging to accomplish the goal of making Medium Wave broadcasting return to its former vitality. The FCC's attempt in the NPRM to address some of AM's problems are laudible, but entirely inadequate to the task, as proposed. The further proposals outlined herein may provide the additional assists and direction that are needed to achieve success.

The National Alliance of AM Broadcasters believes that regulatory changes are needed to overcome the noise interference problems of AM broadcasting, relieve burdensome and obsolete regulation, provide an effective FM Translator lifeline, and map a plan for transition to all digital, medium wave and/or Channel 5 and Channel 6, broadcasting for today's AM broadcasters.

For the Alliance,

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Appendix A

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